

**INTRODUCTION TO SPACE STATION FREEDOM**

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**ABSTRACT**

NASA field centers and contractors are organized to develop "work packages" for Space Station Freedom. Marshall Space Flight Center and Boeing are building the U.S. laboratory and habitation modules, nodes, and environmental control and life support system; Johnson Space Center and McDonnell Douglas are responsible for truss structure, data management, propulsion systems, thermal control, and communications and guidance; Lewis Research Center and Rocketdyne are developing the power system. The Canadian Space Agency (CSA) is contributing a Mobile Servicing Center, Special Dexterous Manipulator, and Mobile Servicing Center Maintenance Depot. The National Space Development Agency of Japan (NASDA) is contributing a Japanese Experiment Module (JEM), which includes a pressurized module, logistics module, and exposed experiment facility. The European Space Agency (ESA) is contributing the Columbus laboratory module.

NASA ground facilities, now in various stages of development to support Space Station Freedom, include: Marshall Space Flight Center's Payload Operations Integration Center and Payload Training Complex (Alabama), Johnson Space Center's Space Station Control Center and Space Station Training Facility (Texas), Lewis Research Center's Power System Facility (Ohio), and Kennedy Space Center's Space Station Processing Facility (Florida).

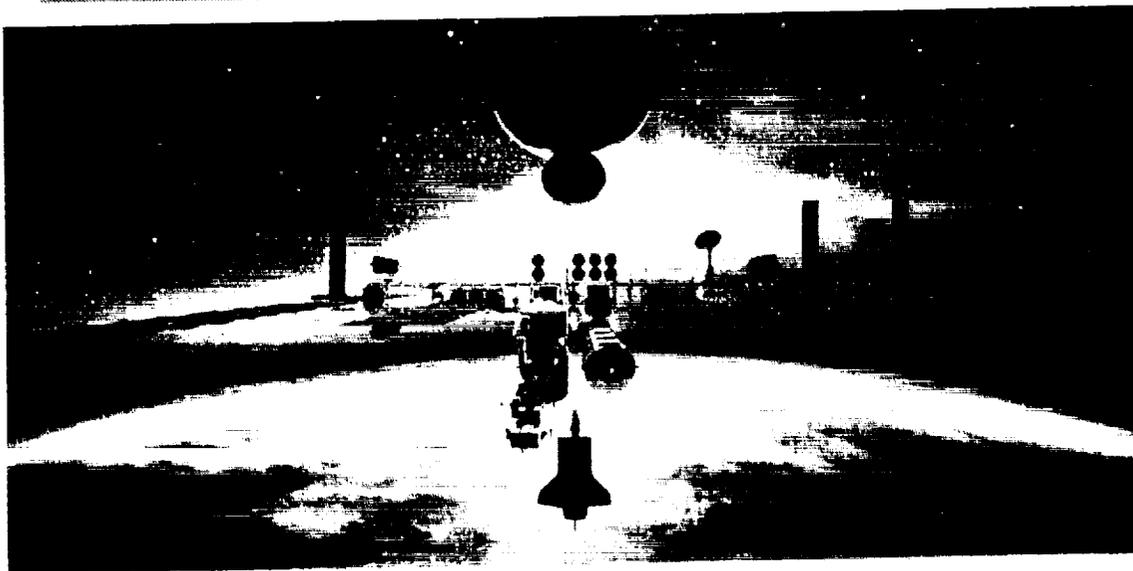
Budget appropriations impact the development of the Space Station. In Fiscal Year 1988, Congress appropriated only half of the funds that NASA requested for the space station program (\$393 million vs. \$767 million). In FY 89, NASA sought \$967 million for the program, and Congress appropriated \$900 million. NASA's FY 90 request was \$2.05 billion compared to an appropriation of \$1.75 billion; the FY 91 request was \$2.45 billion, and the appropriation was \$1.9 billion.

After NASA restructured the Space Station Freedom program in response to directions from Congress, the agency's full budget request of \$2.029 billion for Space Station Freedom in FY 92 was appropriated. For FY 93, NASA is seeking \$2.25 billion for the program; the planned budget for FY 94 is \$2.5 billion. Further alterations to the hardware configuration for Freedom would be a serious setback; NASA intends "to stick with the current baseline" and continue planning for utilization.



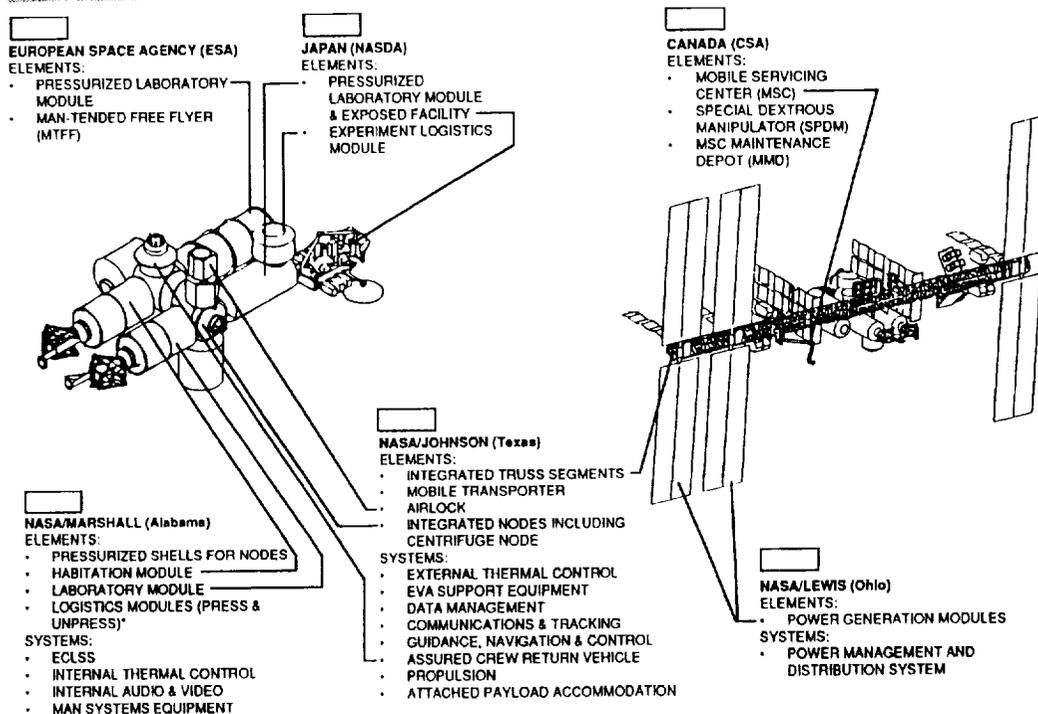
# SPACE STATION FREEDOM

## Great Nations Dare To Explore



It's Time For America To Take Its Place On The Final Frontier

## SPACE STATION FREEDOM PERMANENTLY MANNED CONFIGURATION



\* UNDER A SEPARATE BILATERAL AGREEMENT, ITALY IS PROVIDING TWO MINI PRESSURIZED LOGISTICS MODULES

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# SPACE STATION FREEDOM GROUND FACILITIES



**Marshall**

**Payload Operations Integration Center**

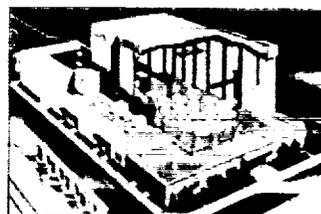
- Payload (cargo) control
- Mission management
- Science operations and integration
- Engineering Support Center for MSFC



**Johnson**

**Space Station Control Center**

- Command and control of operations
- Operations planning and analysis
- Systems monitoring and data processing
- Voice communications and video processing
- Orbit determination and planning



**Lewis**

**Power System Facility**

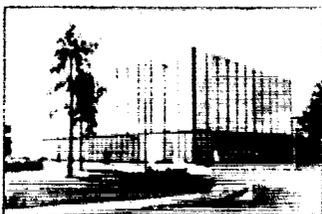
- Development/testing of
  - Power system components and control software
  - Rechargeable battery system
  - Expert automated control system
- Troubleshooting power and control system
- Analysis of electrical power system in orbit



**Marshall**

**Payload Training Complex**

- Provides payload crew training
  - Individual payload launch
  - Integrated payload launch with support system
  - Ground support



**Johnson**

**Space Station Training Facility**

- Provides flight crew and mission control training
- Simulation of onboard and ground procedures
- Individual/team training for Station crews and ground controllers
- Development of new operations procedures



**Kennedy**

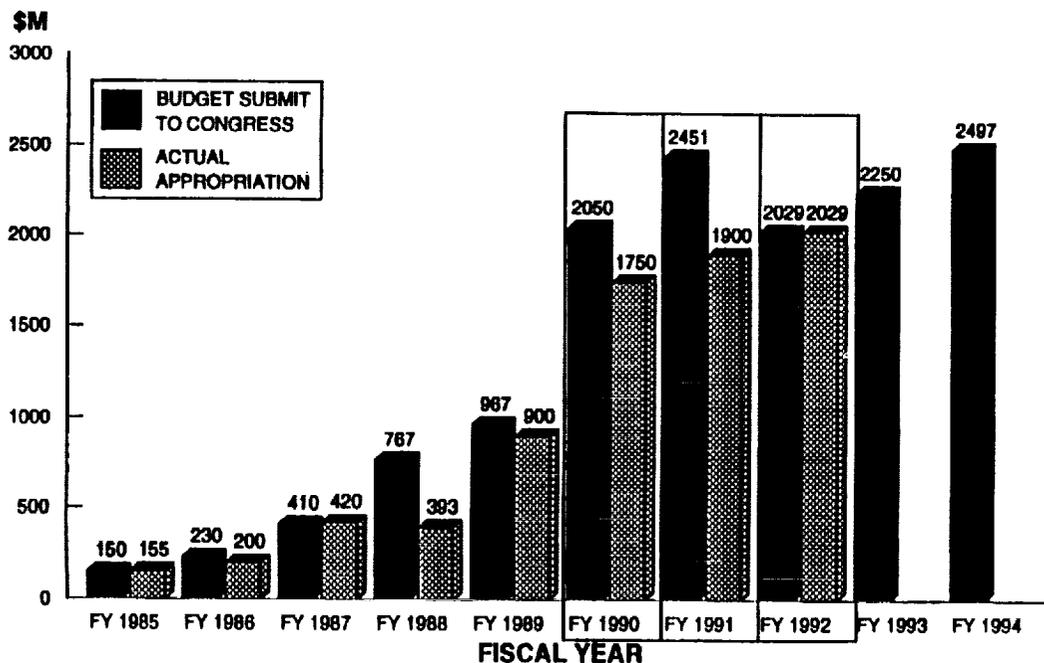
**Space Station Processing Facility**

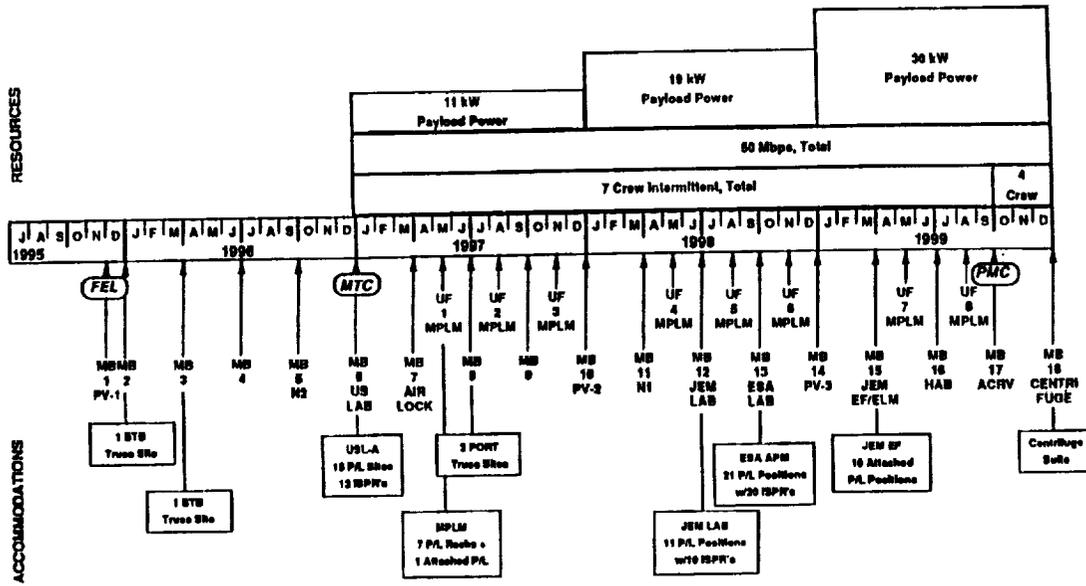
- Prelaunch/postlanding processing of non-hazardous components and supplies
- Receipt, inspection, verification of hardware
- Prepare/load elements, experiments, launch packages
- Final testing prior to launch
- Element turn-around and resupply operations



## Budget Comparisons

### Total Program Budget Authority (RY\$M)





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